REMARKS

Applicants have amended the claims to more particularly define the invention taking into consideration the outstanding Official Action. Applicants have amended claims 20, 22 and 25 (see claim 14 and Examples 1-2 for support). Applicants have canceled claims 1-19, 21, 26-28 from the present application without prejudice or disclaimer and have added new claim 29, see deleted claim 16 for support. Applicants submit that all of the claims now present in the application are fully supported by the specification as originally filed and no new matter is introduced.

The rejection of claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention has been carefully considered but is most respectfully traversed in view of the amendments to the claims.

With respect to Claims 20-25, the suffix "-based" after claim amendments should now be clear that the end-product repellent is in the form of **polyfluorourethane contained within solvents**. With respect to new added Claim 29 (which corresponds to deleted Claim 16), since the expression "semi-continuous polymerization" is commonly used in the field of polymer chemistry, such as in US 7,262,246 or US 7,300,989, amendments were not made as these claims would be clearly understood by one of ordinary skill in the art to which the invention pertains. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claim 16 under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement has been carefully considered but is most respectfully traversed in view of the cancellation of the claim from the present application. Accordingly, it is most respectfully requested that this rejection be withdrawn.

Applicants most respectfully submit that all of the claims now present in the application are in full compliance with 35 USC 112 and clearly patentable over the references of record.

The rejection of claims 1-17, 22 and 23-25 under 35 USC 102(b) as being anticipated by Bartelink et al. has been carefully considered but is most respectfully

traversed in view of the amendments to the claims and the following comments.

Applicants wish to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim.

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

In this regard, Bartelink et al. has disclosed the treatment of textiles for oil and/or water repellency. Referring to column 1, lines 59-68 and column 2, lines 1-34, a blocked polyurethane was produced by reacting a polyisocyanate (as disclosed in the present application) with a polyol (similar to the crosslinking agent disclosed in the present application), and a blocking agent (as disclosed by the present invention). In addition, referring to column 8, lines 54-63 and column 2, lines 1-40, Bartelink et al has disclosed a reaction sequence as the following, within which steps (b) and (c) can be reversed:

(a) reacting the polyisocyanate with the amount of polyol not exceeding the stoichiometric equivalent of the polyisocyanate in an essentially anhydrous condition to form an intermediate, and the reaction temperature is not exceeding 100°C.

(b) adding the blocking agent to the intermediate, with the total amount added not exceeding the stoichiometric equivalent of the intermediate.

(c) adding the repellent compound to the blocked intermediate.

Comparing to the disclosure of the present application, the presently claimed invention relates to a process of producing a solvent-based fluorinated water and oil repellent comprising 20-50% (w/w) blocked polyfluorourethane compound and 50-80% (w/w) solvent, wherein the polyfluorourethane compound is made from fluoroalcohol, diisocyanate or polymeric isocyanate compound, cross-linking agent, blocking agent,

and solvent.

Firstly, within the preparation of polyfluorourethane, the use of solvent in the present invention is necessary and different from Bartelink et al. In Bartelink et al., regarding the preparation of the polyurethane-containing composition, it has been described as a "**solvent-free multi-step process**" (see column 1, lines 61-62), which clearly indicates the absence of solvent in the preparation process. In addition, in Bartelink et al., the participation of solvent is only vaguely described as being "used" upon applying the polyurethane to textiles **after the formation of the polyurethane** (see column 8, lines 66+). On the other hand, in the present invention, the solvent is added **before the blocking agent,** which is **within the preparation of the polyurethane** (examples 1-5, specifically page 9, line 4 of the specification) **and after the addition of the blocking agent**, which is after the formation of the polyurethane (examples 1-5, especially page 9, lines 6-7 of the specification). Therefore, due to the two-stage addition of solvents, the ratio of polyfluorourethane compound to solvent, which is not disclosed in Bartelink et al., is important for the formation of the solvent-based water and oil repellent using the method of the present invention, which is highly distinguishable from the method disclosed in Bartelink et al.

The addition of solvent before the blocking agent is to ensure better heat distribution in order to prevent localized over-heating, which may induce undesirable side effects as described in Bartelink et al. (see column8, lines 32-35), it is also designed to reduce the viscosity of the reaction mixture (see page 3, lines 2-3 of the specification). This would not only be able to solve the problem of increased viscosity upon the addition of catalysts stated in Bartelink et al. (see column 8, lines 35-44), but also eliminate the concern of gel formation using catalyst-containing polyols, so polyols which have been specifically excluded in Bartelink et al. (see column 6, lines 66+ and column 7, lines 1-3) can now be included. Consequently, the incorporation of solvent during the preparation of the polyfluorourethane in the present invention is not only different from Bartelink et al., but also makes a significant contribution to a more reliable and controlled reaction condition. Accordingly, the amended claims of the present invention have novelty, as well as inventiveness over Bartelink et al. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claims 18-21 and 23-25 under 35 USC 103(a) as being unpatentable over Bartelink et al. has been carefully considered but is most respectfully traversed in view of the amendments to the claims and the following comments.

With respect to the rejection of Claim 20, the Examiner has considered that the stoichiometric ratios of the reactants, though not being disclosed in Barterlink et al., can be derived through routine experimentation. However, it is obvious that the lack of reagent ratio disclosure has lead to the indefiniteness in the reaction process, such as "...the repellent compound is added in an amount sufficient to 'cap' the remaining reactive isocyanate groups..." (column 8, lines 26-28" of Bartelink et al.), which may potentially affect the subsequent step if the previous reaction happens to be incomplete, or induce bulk waste of reagents. In Qiu et al., Cote et al., and Clark et al., there is either no disclosure of the reagent ratio at all, or not all the reagent ratios are disclosed. In particular, none of the citations above has specifically disclosed the ratio of the blocking agent. For the reaction times disclosed in the citations, they are either not applicable to the present invention, or not in the range specified in the present invention. It is evident that the reaction sequence disclosed in the present invention is different from the citations listed, therefore requiring different reaction times and reagent ratios.

In contrast, in Claim 20 of the present application, the stoichiometric amount of the cross-linking agent, the diisocyanate or polymeric isocyanate, the fluoroalcohol, as well as the blocking agent have been specified and disclosed. In particular, the disclosure of the blocking agent is a significant improvement, since tests for reaction completion as described in Cote et al. (see column 20, lines 52-54) would no longer be required, which simplifies the reaction process. This controlled range of specific ratio and reaction times are specifically designed for the use in industrialized settings, in which the control of reagent amount, the avoidance of energy waste, as well as the reducing the steps for testing reaction completion are critical. The ratios disclosed in the present invention should not be considered as obvious, since firstly, the method of producing the solvent-based fluorinated water and oil repellent of the present invention is novel, therefore the preferable ratios disclosed previously is not necessarily applicable to the present invention; secondly, specifying the ratio of each component

would allow the present invention to become highly industrializable, reducing both the uncertainties in the reaction and the cost of production, which is considered a significant improvement in relation to inventiveness. Therefore, it is highly evident to one of ordinary skill in the art that the presently claimed invention is patentable, that is, novel and unobvious to the combined teachings of Bartelink et al., Qiu et al., Cote et al., and Clark et al. Accordingly, it is most respectfully requested that this aspect of the rejection be withdrawn.

Regarding claim 20, the incorporation of solvent in a manner according to the present invention is considered not obvious for ones skilled in the art, since none of the citations involves the addition of solvent specifically before and after the addition of the blocking agent. Moreover, the solvents used during the process of producing the solvent-based fluorinated oil and water repellent in the citations are not the always used as the final solvent to be used when applied to targets such as textiles, for example, in Cote et al., the solvent used during the reaction process is stripped off, and replaced by DI water when being applied (see column 20, lines 57-62). Therefore, it must be reemphasized that the ratio of the polyfluorourethane compound to solvent is important for the formation of the solvent-based water and oil repellent using the method of the present invention, and accordingly, the method of the present invention, with simple, reliable reaction schemes and less steps, is inventive over those stated in Bartelink et al., Qiu et al., Cote et al., and Clark et al. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The addition of solvent in Bartelink et al. is different from the present invention. The use of solvent in Bartelink et al. is for applying to textiles after the polyurethane formation, whereas in the present invention, the solvent is added during the formation of the polyfluorourethane compound and after the formation. In particular, the addition of solvent within the formation of polyfluorourethane is considered novel, which eliminates the concern of gel formation and viscosity increase stated in Bartelink et al., and also reduces the risk of localized overheating, which may potentially lead to undesirable side reactions. Therefore, due to the two-stage addition of solvent, the ratio of solvent within the final repellent product is required, which is not specifically defined

in Bartelink et al. Accordingly, by summarizing the above, the present invention has novelty over Bartelink et al.

Since the method for producing the solvent-based fluorinated water and oil repellent in the present invention is considered novel as mentioned above, the stoichiometric ratios and the reaction temperature disclosed in Bartelink et al. is not necessarily applicable to the present invention. Furthermore, none of Barterlink et al., Qiu et al., Cote et al., and Clark et al. has disclosed the specific ratios of blocking agent, for which the final test for reaction completion becomes necessary. By specifying the reaction order, the stoichiometric ratio of all major reactants, and the reaction time, the high industrialization potential of the present invention is foreseeable, as the present invention would not only be able to provide a more reliable and controlled reaction condition, reduce the steps required, but also avoid the waste of reagents and energy. Therefore, the present invention should be considered inventive over Barterlink et al., Qiu et al., Cote et al., and Clark et al. and the rejection be withdrawn.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all the claims now present in the application are most respectfully requested.

Respectfully submitted,
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April 8, 2008